Railway Age

DAILY EDITION

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EDITORIAL

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Contents

Automatic Train Control

The Interstate Commerce Commission in its order on automatic train control is interested primarily in providing for *safe* train operation. Railroads are also interested in safe train operation and in being able to *move* trains expeditiously. The problem now for the railroads is to co-ordinate the use of a new device which will affect train operation with present methods employed for facilitating the movement of trains. Therein lies the real problem. Its solution is one which will largely be up to the signal department because of the introduction of automatic train control as an adjunct to automatic signals. During the coming year this question will be a most important one before 49 of the largest railway systems, and in this connection the Signal section can do excellent work by making an intensive study of automatic train control in all its phases in railroad operation. This subject has been on the Signal section docket for years but has been tabled in the past. The committee assigned train control may well afford to work in co-operation with the other sections of the A. R. A. which are vitally interested. The mechanical department has its problem to solve because of the effect of train control apparatus on the air brake system and on the equipment. The operating department *must* get trains over the road, while the engineering department is affected by clearance problems. It is recognized that the Joint Committee on Automatic Train Control of the A. R. A. is making detailed studies of this important subject and that signal department representatives are on this committee. However, this fact does not lessen the responsibility of the Signal section in determining how train control may be used further to facilitate train operation. If this section can develop means for co-ordinating a new system with one which has produced results to obtain greater track capacity it will have accomplished a great work.

Benefits of New Signal Section Schedule

In contrast to the programs of former years, the meeting of the Signal section, which will open at the Drake Hotel this morning, is not an ordinary stated meeting, but is the annual convention of this body. Heretofore this section has held its annual convention in June, with a stated meeting in Chicago in March and another in New York in November. The new schedule calls for only two meetings a year, the annual convention in Chicago in March, and a stated meeting in New York in November. This change has been advocated by several of the members for years, and should work out to the advantage of all. However, such a change must be met with certain provisions for more of the work to be done in the committee and less on the convention floor. The secretary is to be commended for placing a footnote on the title page of each report in the advance notice to the following effect: "It is suggested that criticisms of the work of this committee be submitted in writing to the chairman prior to the first session of the convention." It is to be hoped that this note has been properly observed. George M. Basford, the first secretary of the old Railway Signaling Club, offered some good advice to the Signal section at the November session, to the effect that details should be thrashed out in the committees and not on the convention floor. If the suggestion of Mr. Basford is observed this will allow plenty of time for the discussion of the more important phases of the application of equipment included in the reports and will also give the younger members, who are in daily touch with field conditions, a chance to express their ideas on the practical application of apparatus being considered.

The Really New Equipment to be Seen

The Railway Age March Dailies presents this year an innovation in the report of the fifteenth annual exhibit of the National Railway Appliances Association which appears on another page of this issue which greatly increases its value as a guide to the exhibit. All devices, materials or equipment which are being exhibited for the first time this year, so far as we have been able to ascertain those that are new are shown in bold face type. This change makes it possible for anyone to see quickly just what is new and different and should go a long way toward forestalling expressions or beliefs that there is nothing new to be seen at the Coliseum on the part of the older and regular attendants of the A. R. E. A. and Signal convention. To the new visitor, the pointing out of the newest devices is of no deep significance since it is fair to assume that he will make up for lost time

and give all of the exhibits a thorough inspection. However, it is a pertinent feature to the seasoned visitor and he can well afford to make use of it. It should also be borne in mind that there are, doubtless, numerous other new features to be seen which are not emphasized in this report because of the difficulties encountered in securing the information. Another point not to be forgotten is that changes are being made continually in most of the standard devices.

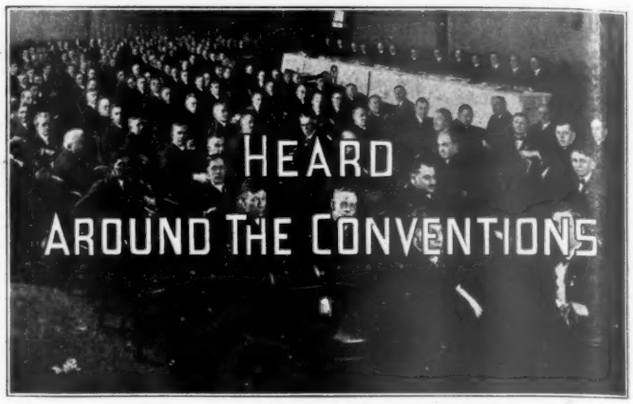
Railroads Have a Heavy Program Ahead

IT HAS BEEN many years since engineers have faced as optimistic an outlook for the future as they do today as they gather for their annual convention. More work has been authorized or is in contemplation than in any recent year. It includes important projects long deferred because of the heavy expenditures involved as well as more liberal improvement programs of routine maintenance work. Every class of railway facilities will participate in this program. The necessity for these facilities was demonstrated during the extended period of heavy traffic which began last fall by the record breaking shortage of cars (which is simply an expression for the shortage of railway facilities of various kinds). This shortage has not yet been overcome and with the opening of the active construction season at hand and with the large amount of highway and other building work in prospect, it is a certainty that we will soon face another congestion of traffic which will limit the activities in many industries, unless additional facilities are provided with all possible speed.

This heavy traffic is also contributing largely to increased earnings, with the result that the net operating income of the Class I roads for January was at the annual rate of 5.54 per cent on the tentative valuation. As an indication of the amount of work under way, figures compiled from budgets already approved by 32 roads, with an aggregate mileage of 115,000, show total expenditures already authorized of more than $425,000,000. On the basis of these figures the year's improvement and engineers' program may be estimated conservatively to exceed $750,000,000. One road has already authorized improvements and additions to roadway and structures alone aggregating more than $32,000,000, and others have budgets aggregating this. This work involves all classes of construction.

Projects on which field or office work has been authorized within the last month include new terminal facilities on the Atchison, Topeka & Santa Fe at Emporia, Kan., involving an expenditure of $5,000,000; shops on the Chicago & Eastern Illinois at Evansville, Ind., $3,000,000; a new double track bridge across the Mississippi river for the Santa Fe at Fort Madison, Iowa; new terminals for the Southern Pacific and the Union Pacific systems at Los Angeles, estimated to cost $1,000,000 and $1,500,000 respectively; 133 miles of new line for the Florida East Coast in Florida; a new pier on the Chesapeake & Ohio at Norfolk estimated to cost $4,000,000; new shops on the Pere Marquette at Grand Rapids costing $1,500,000 and a locomotive terminal at Detroit costing $1,000,000, etc.

The effect of this program will be evidenced by the absence of some familiar faces at the convention because of the necessity for concentration on the organization of forces, while other men will attend in order to secure help from other engineers and from the exhibits.



The Executive committee of the American Railway Bridge and Building Association will meet in the Congress hotel at five o'clock this afternoon to consider plans for the Seattle convention next October and to dispose of such other business as may be brought before the meeting. All members of this association are invited to attend this meeting.

* * *

The officers of Division IV—Engineering of the American Railway Association met at the Congress hotel at 9:30 yesterday morning. Following their adjournment at 11:30 the Board of Directors of the American Railway Engineering Association met to complete the details for the convention and to transact other routine business.

* * *

Members of the Track committee met for luncheon with the Standardization committee of the Manganese Track Society at the Chicago Engineers' Club yesterday noon, following which an informal joint meeting of the two committees was held at the American Railway Engineering Association rooms to discuss the report of the committee and the manner of presenting it before the convention.

* * *

The Portland Cement Association invites the members of the American Railway Engineering Association to participate in an excursion to the Structural Materials Research Laboratory and the Underwriters' Laboratories on Friday. In the forenoon the party will inspect the research laboratory at Lewis Institute and will witness tests on concrete. After lunch at the institute the party will watch a fire test of a concrete block wall at the Underwriters' Laboratories, at which tests will be conducted at temperatures 2,000 deg. F., or more than 20 per cent hotter than ordinary fires. Reservations for this trip can be made at the registration desk outside the convention room.

* * *

The many friends of F. A. Poor, president of the P. & M. Company, in the railway and railway supply fields will deeply sympathize with him because of two great losses he has recently sustained. Only a few weeks ago his father died. Last Saturday his older daughter, Natalie, who was not quite thirteen years old, also died. The little girl was a beautiful child of very unusual promise. She had shown artistic tastes and tendencies, and had displayed an exceptional gift for writing poetry. Friends of the family had been allowed from time to time to see verses written by her which revealed an imagination and a talent for versification and phrasing which showed that she had great natural endowments, and was mentally developed far beyond her years. Natalie was sick for some weeks, her illness developing into pneu-

monia. She had been showing signs of improvement and was believed to be approaching a state of convalescence when suddenly a turn for the worse came. The funeral was held from the family residence in Chicago yesterday.

A. R. E. A. Convention Program

The following is the program for the convention of the American Railway Engineering Association which will open this morning in the Florentine room of the Congress hotel. Morning sessions will convene at 9 a. m. and afternoon sessions will convene at 2 p. m.

First Day—Tuesday, March 13

President's address.
Address by R. H. Aishton, president American Railway Association.
Reports of secretary and treasurer.
Reports of committees:

Shops and Locomotive Terminals	Bulletin 251
Signals and Interlocking	Bulletin 251
Standardization	Bulletin 251
Rail	Bulletin 251
Ballast	Bulletin 251
Signs, Fences and Crossings	Bulletin 251
Masonry	Bulletin 251
Iron and Steel Structures	Bulletin 252
Water Service	Bulletin 252

Second Day—Wednesday, March 14

Ties	Bulletin 252
Economics of Railway Location	Bulletin 252
Economics of Railway Labor	Bulletin 252
Stresses in Railroad Track	Bulletin 253
Memorial Meeting (Eleven o'clock)	
Track	Bulletin 253
Economics of Railway Operation	Bulletin 255
Rules and Organization	Bulletin 253
Roadway	Bulletin 253

Annual Dinner at 6:30 p. m. (Gold Room, Congress Hotel).

Third Day—Thursday, March 15

Uniform General Contract Forms	Bulletin 253
Electricity	Bulletin 254
Buildings	Bulletin 254
Wooden Bridges and Trestles	Bulletin 254
Records and Accounts	Bulletin 254
Yards and Terminals	Bulletin 255
Wood Preservation	Bulletin 255

New business.
Discussion of revision of classification of accounts, Interstate Commerce Commission.
Installation of officers.
Adjournment.

The Annual Dinner

The annual dinner of the American Railway Engineering Association will be held in the Gold room of the Congress hotel on Wednesday evening. J. L. Campbell, president, will preside as toastmaster. The speakers will include Hon. F. B. Carvell, chief commissioner, Board of Railway Commissioners for Canada, who will discuss "The Canadian Railway Problem"; F. W. Parsons, editor and journalist, who will speak on "Looking Ahead," and Judge Harry V. Osborne, president, New Jersey Board of Public Utility Commissioners.

A Locomotive Terminal Meeting

A symposium on locomotive terminals will be presented before the Western Society of Engineers at its rooms in the Monadnock block this evening. R. N. Begien, general manager, Baltimore & Ohio western lines, will discuss "What the Operating Department Requires from a Locomotive Terminal"; L. K. Sillcox, general superintendent motive power, Chicago, Milwaukee & St. Paul, will present a paper on "What the Mechanical Department Requires from a Locomotive Terminal," and W. T. Krausch, engineer of buildings, Chicago, Burlington & Quincy, will describe "How the Engineering Department Meets These Requirements." A special invitation is extended to visiting railway engineers to attend this meeting.

The Program of the Signal Section

The program for the annual convention of the Signal Section of the American Railway Association which will convene at the Drake Hotel this morning is as follows:

First Day—Tuesday—March 13

Morning Session

Chairman's address.
Report of Secretary.
Committee VIII. A. C. Automatic Block Signaling.
Committee II. Mechanical Interlocking.
Committee XII Contracts.

Afternoon Session

Paper by C. A. McCune, Page Steel & Wire Company.
Committee IX. Wires and Cables.
Committee XI. Batteries.
Committee XX. Highway Crossing Protection.
Committee V. Maintenance, Rules and Instructions.
Committee III. Power Interlocking.

Second Day—Wednesday—March 14

Morning Session

Committee XIII. Electrical Testing.
Committee XIX. Economics of Railway Signaling.
Committee VI. Standard Design.
American Engineering Standards Committee.

Third Day—Thursday—March 15

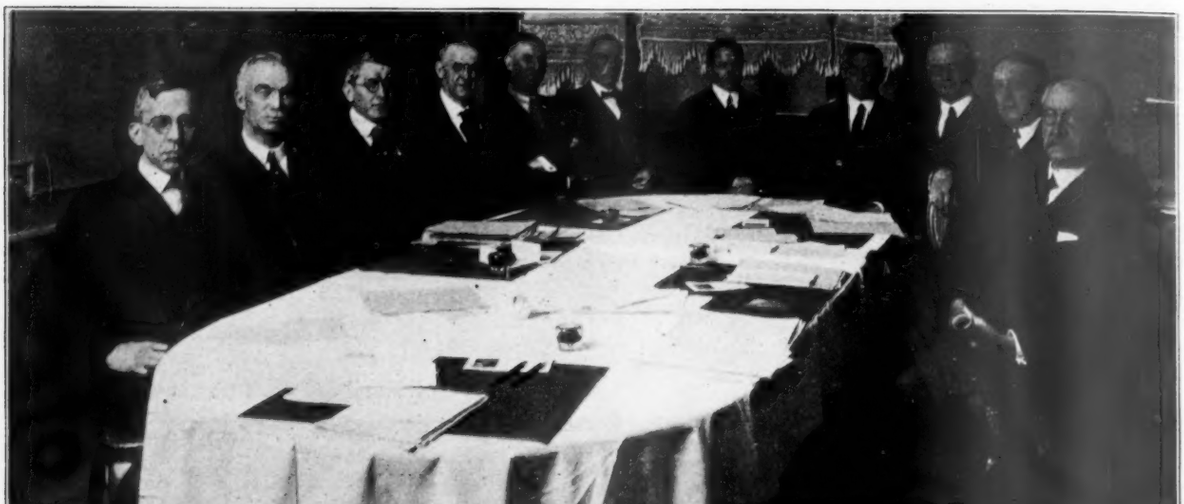
Morning Session

Committee IV. D. C. Automatic Block Signaling.
Committee XVIII. Direct Current Track Circuits.
Committee XVII. Pole Lines.
Regulation.
Committee VII. Direct Current Relays.
New Business, election and installation of officers.
Adjournment.

Excursion to Madison on Friday

The Forest Products Laboratory, Madison, Wis., invites railway men interested in wood preservation, structural timbers and allied subjects to visit the laboratory on Friday of this week to witness the work which is being done and to participate in a discussion of research work on timber preservation. The tentative program includes an inspection of the Forest Products Laboratory as follows:

8:00 to 10:00	Inspection of Forest Products Laboratory.
10:00 to 12:00	Discussion on toxicity tests and demonstrations of methods and of grading rules for structural timbers.
1:00 to 2:00	Crushing test of a 12-in. by 12-in. by 24-ft. southern pine column in the million-pound testing machine of the timber testing laboratory.
2:00 to 4:30	Demonstrations. Experimental work on preservative treatments. Chemical work on wood preservatives. Strength tests of wood. Testing toxicity.
4:30 to 6:00	Inspection of the test track which is maintained co-operatively by the Chicago, Milwaukee & St. Paul and the Forest Products Laboratory, weather permitting.
6:30	Dinner, followed by general discussion of the program of investigating work on wood preservation and allied problems.



The A. R. E. A. Board of Direction Met Yesterday

A. R. E. A. Completes Most Successful Year

Continuance of Activities When Other Organizations Retrench Indicates Its Virility

THE AMERICAN RAILWAY ENGINEERING ASSOCIATION is completing the most successful year in its history. Although the past 12 months have been troublesome for all railway men and the activities of numerous other organizations have been restricted, the association has continued its program in even greater volume than heretofore. Its membership has continued to increase until it is now the largest on record. Its technical activities have continued to expand and the quality of its work, as reflected in the reports to be presented at this meeting, has been maintained at the high level of former years. In addition to the regular proceedings, it has issued a revised and enlarged edition of its Manual during the past year, containing more than 1,000 pages of recommended practice for the design, construction and maintenance of railway structures. With all of these activities, it has shown a surplus of receipts over expenditures of more than $3,000, indicating a healthy financial condition.

This record stands out in such marked contrast with that of other similar associations in the railway field that it deserves analysis to determine the reasons. The Mechanical division of the American Railway Association (formerly the American Railway Master Mechanics' Association and the Master Car Builders' Association), after cancelling its conventions in three of the last six years, announced last November that the meeting this year would be confined to a one-day session at Chicago, which action was later amended to provide for a three-day convention without exhibits. The Signal section, formerly the Railway Signal Association, was forced by retrenchment last fall to abandon its sectional meetings which it had established in 21 centers and had maintained for periods up to seven years. For a similar reason, the Telegraph and Telephone section of the American Railway Association (formerly the Association of Railway Telegraph Superintendents) reduced the number of its meetings from two to one. In contrast, the American Railway Engineering Association has adhered to its program of activities in full and has prospered therefrom.

The reason for this contrast dates back of the present year to 1918. For several years prior to that time the opinion prevailed among several railway officers prominent in the affairs of the American Railway Association that all other railway associations should be made branches of this organization and brought under its control. With the advent of federal control and the bringing of the roads and the American Railway Association under a central management, this movement took definite form and the matter was presented to the various associations by the American Railway Association. Because of the dominant position of the American Railway Association, controlled as it is by the executive officers of the railways, its proposal was accepted by all the associations referred to above, except the American Railway Engineering Association. With this one exception they surrendered their individual identities to become subsidiaries of the central organization. The American Railway Engineering Association alone stood out, suggesting in place of the amalgamation proposed, a plan of co-operation which would insure to each the benefits of co-ordinated activities while retaining for the Engineering Association its individuality and independence of acton. This was effected by making the American Railway Engineering Association the "Engineering Division" of the American Railway Association so that it functions in a dual capacity. Although it was predicted by some, at the time that the American Railway Engineering Association declined to participate in the amalgamation, that it would be supplanted by an engineering division of the American Railway Association, time has demonstrated the wisdom of the course taken.

Outstanding among the evidences of virility of the American Railway Engineering Association is its growth in membership, In March, 1918, shortly prior to the movement for amalgamation, the Engineering Association had 1,387 members. During the past year its members passed the 2,000 mark, an increase of 48 per cent in five years. This growth has been obtained without any lowering of the qualifications or any drive for mem-

bers. The attendance at the conventions has shown a similar increase, the total registration last year not only establishing a new record, but exceeding that of 1918 by 75 per cent. Approximately 36 per cent of the total membership attended the convention last year, a high proportion for a national association of this character, and all indications point to even higher records this year.

In its technical activities, the prevailing tendency of the last few years has been the recognition of the widening field for the application of engineering principles to the problems of transportation and the broadening of the scope of association work accordingly. This has been most evident in the creation of a Committee on Economics of Railway Operation, which is studying the application of engineering analysis to the problems of transportation. Indicative of the scope of its work may be mentioned among other subjects assigned to it, the effect of speed of trains upon the cost of operation, methods of increasing the traffic capacity of a railway, and the through routing of trains and its effect upon the capacity of terminals. As the requirements of transportation are becoming less susceptible to rule-of-thumb methods, the opportunities for investigations in this direction and for corresponding service to the transportation industry will increase proportionately. The association has done well to recognize this trend and prepare to meet it.

Anticipating the impending acute shortage of labor and the necessity for detailed consideration of the problems arising therefrom, the sub-committee on Economics of Labor of the Track Committee was made an independent committee in 1918 and it has since concentrated on the study of this phase of maintenance work. Probably the first large railway association to undertake the study of this specific problem, it has already made marked progress. Few committees in the association have attracted more interest or hold greater promise.

That the attention given to these newer problems has not detracted from the consideration of those problems of engineering design and maintenance for which the association was founded, is indicated by the high character of the reports of the standing committees. In few, if any years, have greater contributions been made to engineering literature than the analysis of passenger terminal facilities, specifications for steel bridges, etc., which will be presented at this convention. Recognition of the fact that new engineering problems are arising is also indicated by the creation of a committee on Shops and Engine Terminals, which in the three years of its existence has added much to the knowledge of the requirements of this class of facilities which have been so long neglected.

Another development in a different direction, which is as yet only in its earliest stages, but which gives promise of great future value to the railways, is the creation of a committee to co-operate with the colleges and universities in the training of young men for railway service. Of late years the roads have not drawn their proportion of the graduates and with the rapidily increasing demands of transportation, it is more important than ever that college-trained men be drawn into the service. It is the plan that this committee shall strive to create a recognition of the value of such training on the part of railway officers, shall establish a contact with the faculties of the colleges so that their students may be fitted for the work expected of them after graduating and shall present to the student the opportunities which the transportation industry, in its various phases, offers.

With these varied and expanding activities, it is to be expected that the association is growing in influence and its recommendations are gaining more weight. Its standards are coming into more general use in this country and abroad. Indicative of its growing influence is the work which the committee on Records and Accounts is doing at the instance of the Interstate Commerce Commission, representatives of that committee having worked at length with representatives of the commission within the last few weeks in its revision of the classification of accounts. By bringing the viewpoint of the practical engineering officer to the assistance of the employees of the commission engaged in the preparation of the new regulations, the needs of the commission will be met without the introduction of impractical or unnecessarily burdensome requirements. Such service is highly constructive.

A record such as this is an indication of individual interest among the rank and file of the membership, which, if maintained, spells a bright future for the association and a valuable aid for the roads. Unofficial in character, its recommendations bear the weight due them solely because of fundamental merit, while official support is available when needed through co-operative arrangement with the American Railway Association. Such interest is possible in greatest measure only where committee work is voluntary rather than taking on the character of regular duties and where attendance at the conventions is a matter of personal desire and enthusiasm rather than of assignment and implied or direct official representation.

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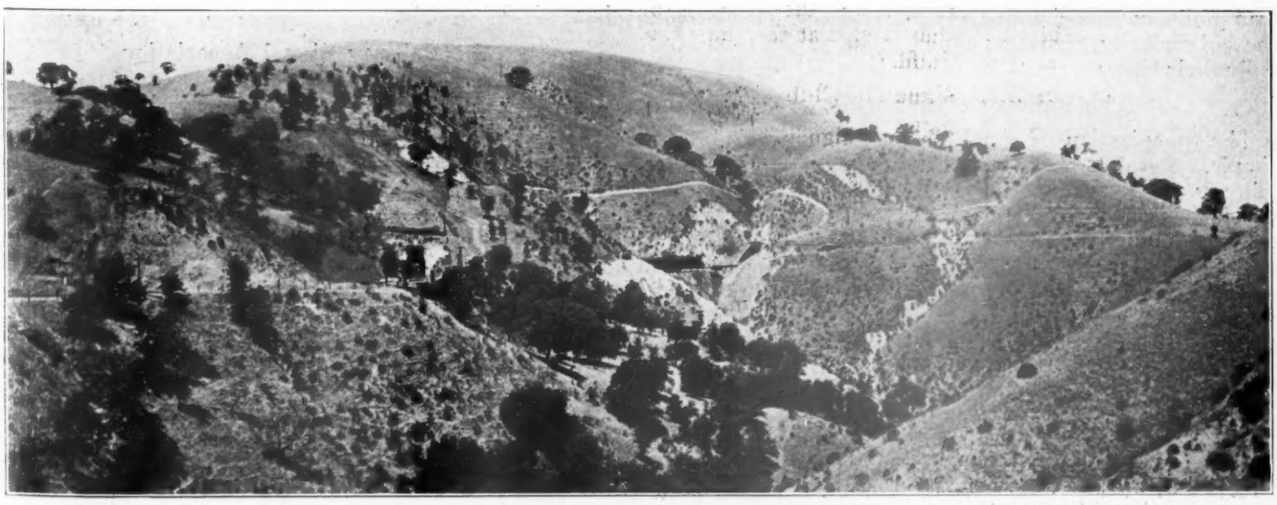


On the Southern Pacific in the Tehachapi's

Twenty-eight Years' Progress in Signaling

Some Facts About the Origin, Growth, Changes and Activities of the Signal Association

THIRTY-THREE YEARS AGO a young man left the motive power department of a railroad to become signal engineer of a 6,000 mile road having 15 interlocking plants and plenty of signal problems, with no other preparation for his new position than a study of the first catalogue put out by the Union Switch & Signal Company, a technical education and sound common sense. That man was George M. Basford. When he was appointed signal engineer of the Chicago, Milwaukee & St. Paul he had a staff of two men to look after the 15 interlocking plants and handle a lot of new construction. Mr. Basford said that "The few wrecks which did occur were always at one of these plants. The nights were full of trouble and the winter storms kept the so-called 'Signal Engineer' himself at the large plants trying to keep the machines working; there was no one else to do it."

Signaling then was not considered as a means of increasing track capacity. Both signals and signalmen were tolerated as necessary evils. Young men who pioneered in signaling on western roads early saw the need of recognition of the possibilities and standing of signals and signalmen. These men seldom got together and then only in the offices of the signal companies in Chicago. In January, 1895, Mr. Basford became mechanical department editor of the Railway and Engineering Review and on March 11 of that year he called together at his office W. H. Elliott, H. D. Miles, W. B. Turner, W. J. Gillingham, Jr., and V. K. Spicer to consider the formation of a signal club. That night the Railway Signaling Club came into existence with Mr. Gillingham as the first chairman and Mr. Basford as the first secretary-treasurer.

The purpose of the Railway Signaling Club, as stated by Mr. Basford before the election of the first chairman, was "to inaugurate a systematic movement in the improvement of the signaling of railroads in the hope that the development now begun may lead to such a growth of signaling, and of signalmen, as to place this country at the head, rather than at the foot, of the list in the destruction of life and property through accidents, which correct and complete signaling would prevent." Such was the beginning of the present Signal section of the American Railway Association and little did the founders of the old Railway Signaling Club realize at the time how fully their hopes were to be fulfilled.

The Railway Signaling Club

The organization of the Railway Signaling Club was simple. Results were obtained by discussion and committee work. Papers were read on signal subjects and various signal systems and plans used by different roads were studied with a view to establishing uniformity in practices and materials. The club met monthly and the secretary had to provide a method of distributing literature and other interesting data presented at the meeting as no funds were available for printing the information.

The first constitution was adopted in March 11, 1895, a new one superceding it in January 28, 1896. Three classes of membership were provided, members, associate members and honorary members.

The new constitution remained in effect, with minor alterations, until 1906, when the monthly meetings were discontinued and five meetings a year were scheduled and membership dues were provided for. The club recognized the fact that if uniform practices were to be adopted, these would need the endorsement of the American Railway Association to be effective and the constitution adopted in 1896 provided for the club making such recommendations. In 1897, in line with the action taken, rules for the operation and maintenance of interlocking plants were submitted to the A.R.A. This marked the first official contact between the two bodies. On January 11, 1898, a recommendation was sent to the A.R.A. that green be used for the "all clear" night signals, red and green for the caution signal and red for the stop signal.

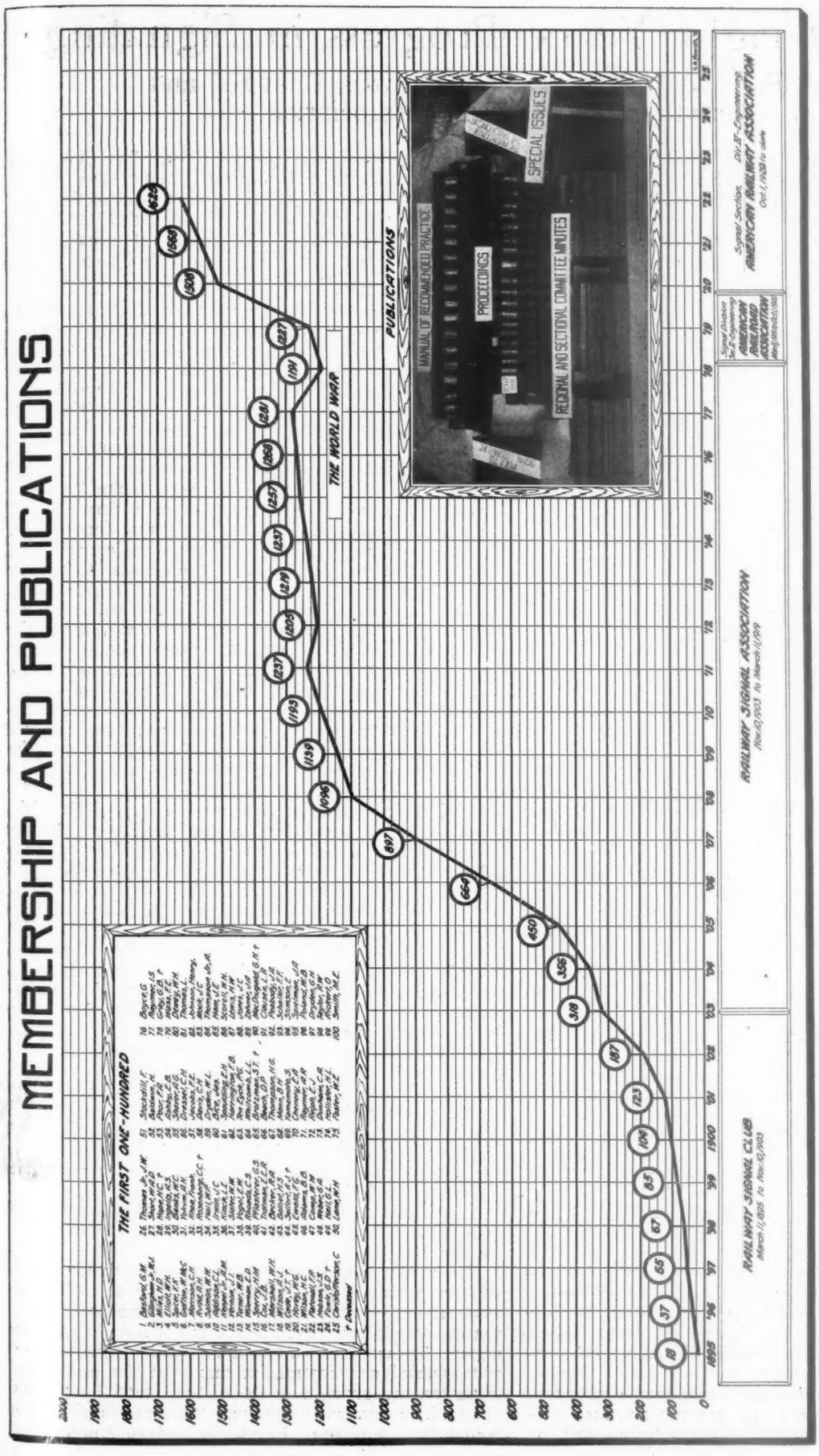
Much difficulty was encountered in the beginning in providing subject matter for analysis and debate, but gradually volunteers offered their services and much useful information was soon made available. It was not until the fall of 1902 that permanent committees were organized, when nine committees were formed. The subjects assigned were Signal and Track Circuits; Organization; What Shall Be Considered as Cost in Making Estimates on Installations and Maintenance; Cost of Installing Iron and Copper Wire for Line Circuits; Distant Signals (when should they be mechanical, semi-automatic or automatic); How Best to Signal Automatically a Single Track Road; Standards; Three-position, Separate Home and Distant and Overlapping Automatic Block Signals and Topics. This change stimulated attendance, debate and written comment.

The beginning of the Railway Signaling Club was unpretentious and discouragements of all kinds were faced. Conditions were at their worst about 1898, when the affairs were straightened out and the club started on a permanent and healthy growth. The club was originally a western club, but soon expanded and the first eastern meeting was held in New York on September 14, 1897. At the New York meeting on March 10, 1903, C. C. Rosenberg, feeling that the club had become international in scope, made a motion that a ballot be taken at the annual meeting on changing the title of the organization to the Railway Signal Association. On November 10, 1903, at the annual meeting in Detroit, Mr. Rosenberg's motion was voted on favorably and the name was changed accordingly.

The Railway Signal Association

The signal organization was known as the Railway Signal Association for a period of 15 years extending from November 10, 1903, until it became a part of the American Railway Association on March 1, 1919. It was during this period as an independent organization that its greatest development took place and the foundation was laid on which it built up to its present high standing. In this interval the membership increased from 318 up to 1,281.

Up to the time the name was changed to the R.S.A. there was little or no literature published, so in 1904 the secretary was instructed to republish the proceedings of the Railway Signaling Club and the R.S.A. to make the papers, reports and discussion accessible. Two volumes were published containing a digest of the proceedings from the organization of the club in 1895 up to 1906, since which time the proceedings have been published in bound form annually. In addition, advance notices and



A Chronological History of the Development and Activities of the Signal Section

proceedings of the meetings are printed for distribution to the membership. The next step made was to start the Manual, which was originally issued in 1912 and to which revisions and additions are made yearly. This Manual now contains all approved specifications and standards covering this important field.

As the R.S.A. continued to grow, the need was felt for some way to reach and interest the younger men in the signal field, many of whom were not members of the R.S.A., as these were the men who would form the backbone of the organization in the future. In 1915 it was felt that the time was right to consider an expansion of the association to reach the newer men, and branches to the main body were formed. These were termed Regional committees. Twenty-one of these committees were eventually organized, including one in England and one in Canada. These committees were later called Sectional committees when, at the end of Government control in 1919, the American Railroad Association was reorganized as the American Railway Association. Through this agency much good information on maintenance and construction was made available for the younger men. Unfortunately,

these committees were abandoned in 1922 as a retrenchment measure.

The R. S. A. as a Part of the A. R. A.

The Railway Signal Association functioned under this name from November 10, 1903, until March 1, 1919, when by action of the Board of Directors on February 24, 1919, it became a part of the American Railway Association. After the Government assumed control of the railroads the status of a number of the railroad association was in doubt and for a time it was feared that the activities of some would be suspended during the period of Government control. It was then proposed to amalgamate some of the auxiliary associations with the A.R.A., but no action was taken until the director general of railroads issued Circular 70 on January 10, 1919, stating that the A.R.A. had revised its articles of organization and by-laws and enlarged its scope to cover the activities of the R.S.A. as well as five other associations. The action taken by the Board of Directors of the R.S.A. on February 24, 1919, raised considerable protest from some members on the floor at the March meeting that year, but the Board's action was ratified. This ended the old voluntary association which was now known as the Signal division, Engineering section, A.R.A.

At the end of federal control the American Railway Association was revised and the Signal division became the Signal section, Engineering division of the A.R.A. on October 1, 1920, by which name it is known today.

Speaking of the formation of the Railway Signaling Club, its problems, and its place in the railroad field, Mr. Basford on February 21, 1923, said: "Then as now the signal problem lies in the degree of appreciation on the part of operating officers as to what signaling can do to keep the wheels of railroads moving. Signaling as a safety feature is more important than it ever was. As an operating feature its functions develop daily into more and more vital importance. It means safety. It means more. It means profit in transportation. It is my hope that signal engineers will appreciate the possibilities that lie before them and that they will give sufficient time to the details of signaling, but that they will direct their major efforts to becoming operating factors of our railroads. This is exactly what the Railway Signaling Club stood for on March 11, 1895. It can stand for no less today.

Death Takes Prominent Members

DURING THE PAST YEAR the American Railway Engineering Association suffered grievous loss through the death of several members who gave freely of their time, thought and energy to its upbuilding and welfare. Foremost among these are three whose names particularly have been prominently associated with the affairs of the A.R.E.A. for many years. These men were A. S. Baldwin, William McNabb and C. E. Lindsay, the death of the last two coming almost on the eve of the convention.

A. Stuart Baldwin, vice-president of the Illinois Central and president of the American Railway Engineering Association for the year ending in March, 1917, has left a record with the association which can be described eloquently in the one word "service." Joining the association in 1901 he took an active part in its work, serving for several years on the Committee on Signs, Fences and Crossings. He was also active in the work of the Committee on Rail and Stresses in Track. He became a director in 1911 and served the two year term as vice-president before his election to president, after which he remained on the Board of Direction for five years as a past president, retiring at the end of the last convention.

The name of William McNabb, who died on February 23, appeared on the rolls of the association as an engineering officer of the Grand Trunk, with headquarters at Montreal, Que., but those who knew the place he occupied in association affairs will always consider him as Canada's representative in the A.R.E.A. He was president of the association for the year ending in March, 1910, but for many years prior and subsequent to his term as presiding officer, he played an important part in the conduct of association affairs through a long period of service on the Board of Direction.

C. E. Lindsay, special engineer of the New York Central, whose time for the past five years was occupied almost entirely with labor problems, died on February 17. Mr. Lindsay was one of the hardest working members of the association, who did a yeoman service by his close scrutiny of the committee reports, as a result of which he won the sobriquet, "Watch Dog of the Manual." Because of this sincere interest in the maintenance of a high standard of excellence for the association's rules and practices, his service while a member of the Board of Direction was directed primarily toward a supervision of the Manual inclusions. Mr. Lindsay was twice a director, once by appointment to fill a vacancy and once by election.

While never as conspicuous at the convention as men who took a more active part in the discussions, F. J. Angier, superintendent of timber preservation of the Baltimore & Ohio, who died only a few days after the close of the convention last year, enjoyed a most intimate acquaintance with a particular group of the members. Mr. Angier was a leading spirit in the field of timber preservation, having been a member of the committee on Wood Preservation for seven years and being president of the American Wood Preservers' Association at the time of his death and having previously served for many years as its secretary.

F. B. Rice, engineer maintenance of way of the Richmond, Fredericksburg & Potomac, was a regular attendant at the convention for many years and his presence will be missed by those who have enjoyed meeting him there from year to year. Like Mr. Baldwin, Mr. McNabb, Mr. Lindsay and Mr. Angier, he attended last year's convention.

A. L. Johnson of the Corrugated Bar Company, Buffalo, N. Y., while not active in association affairs in recent years, will be remembered as one who had an important part in the advancement of reinforced concrete construction in the United States.

A. W. Gibbs, chief mechanical officer of the Pennsylvania System, and a prominent figure in his chosen field, did honor to the association during his life by his place on the membership roll. While primarily a mechanical man, who was past president of the American Railway Master Mechanics' Association, he took an active part in the study of rail and served for a number of years on the Committee on Rail.

A. F. Rust, consulting engineer of the Kansas City Southern and previously chief engineer of that property, died on May 11, 1922.

This review is not complete without reference to three members who died previous to the association's 1922 convention, but whose names were not numbered in the deaths recorded by the secretary in his report there presented. These are A. T. Hardin, operating vice-president of the New York Central System; John Ehrke, assistant to the general superintendent of the Grand Trunk, and C. H. Niemeyer, acting engineer maintenance of way of the Central Pennsylvania division, Pennsylvania System.

Annual Exhibit of the N.R.A.A. at the Coliseum

Products of 163 Exhibitors in Setting of White and Gold Greet Convention Visitors

AT EIGHT O'CLOCK yesterday morning the doors of the Coliseum and Annex swung open on the fifteenth annual exhibition of the National Railway Appliances Association. Every available inch of space on the ground floor of the Coliseum and Annex is being utilized by the products of the 163 exhibiting members at this year's show, yet there is ample aisle space to prevent uncomfortable crowding. Through the efforts of C. W. Kelly, secretary of the National Railway Appliances Association, and his assistants, everything was in readiness for the opening hour, and the scene as the first visitors entered the building evidenced the complete success of their work.

The decorative scheme this year is more attractive and tasteful than any of its predecessors. The ceiling is entirely concealed by streamers of white and gold bunting which sweep from the balcony rails to the roof, and are set off at the sides by occasional flounces of green material. A new feature this year is the solid panels between the booths, enameled in white and trimmed in gold. The white columns are square topped, and emblazoned on the four sides is the crest of the Association in gold. Another attractive innovation is the semi-partitions extending from the high center panels a short distance out upon the lower partitions which add to the individuality of the booths. The firm names, as usual, are in green on a white background.

Officers of the association confidently expect a four day's attendance which will break all previous records, partly because the conventions of the Railway Signal Association and the American Railway Engineering Association occur at the same time this year, but mostly because of the optimistic sentiment among the railroads and the greatly stimulated activity in the supply trade field. Passes to the number of 10,500 have been issued and 75,000 invitations have been sent to railway officers, members of the Interstate Commerce Commission and similar bodies, and to the technical schools. The number of tickets requested by railway officers for themselves and subordinates has been greater this year than at any previous time, and it is believed that at least 22,000 visitors will view the exhibition before its close.

Entrance to the exhibit is, as usual, through the Wabash avenue entrance of the Annex. A free check room is located at the right of the entrance and registration desks for members of the American Railway Bridge and Building Association, the Roadmasters' and Maintenance of Way Association, the American Railroad Signalmen's Association, the National Scale Men's Association and the National Railway Appliances Association, are situated directly in front of the entrance. Four men and four girls will be on hand at all times to assist in the registration of the members. A restaurant is located in the basement of the Coliseum where visitors may secure food without the trouble of leaving the building. Entrance to the basement is by a stairway opposite the main entrance in the center of the Coliseum. Public telephones are provided at the south end of the Wabash avenue side of the same building. The exhibit will be open each day from 8 a. m. to 6:30 p. m., with the exception of Tuesday, when the doors will close at 10 p. m., and the last day, Thursday, March 15, when the exhibition will end at 1 p. m.

The officers and members of the board of directors of the National Railway Appliances Association who served during the past year are: President, T. W. Aishton, National Malleable Castings Company, Chicago; vice-president, L. W. Shugg, General Electric Company, Schenectady, N. Y.; secretary-treasurer, C. W. Kelly, Kelly-Derby Company, Chicago; honorary director, G. C. Isbester, American Chain Company, Chicago; directors, E. A. Johnson, Duff Manufacturing Company, Pittsburgh, Pa.; A. J. Filkins, Paul Dickinson & Company, Inc., Chicago; A. A. Taylor, Fairbanks-Morse & Company, Chicago; G. E. Geer, Wyoming Shovel Works, Chicago; W. J. Gillingham, Hall Switch & Signal Company, Garwood, N. J., and W. B. Murray, Miller Train Control, Danville, Ill.

Annual Meeting

The annual meeting of the Appliances Association was held yesterday at the Coliseum. The reports of the president and secretary were approved and the following officers were elected for the ensuing year: President, L. W. Shugg, General Electric Company, Schenectady, N. Y.; vice-president, A. J. Filkins, Paul Dickinson, Inc., Chicago; honorary director, T. W. Aishton, National Malleable Castings Company Chicago, Chicago; directors for three years, H. S. Mann, Metal & Thermit Corporation, Chicago, and A. L. Greenabaum, O. F. Jordan Company, East Chicago, Ind.; director for one year, L. E. Weidman, Frog, Switch & Manufacturing Company, Carlisle, Pa. The directors who hold over are G. E. Geer, Wyoming Shovel Works, Chicago; W. J. Gillingham, Hall Switch & Signal Company, Garwood, N. J., and W. B. Murray, Miller Train Control Corporation, Danville, Ill.

L. W. Shugg, President-Elect

L. W. Shugg, the newly elected president of the National Railway Appliances Association, brings to the executive head of this body a long experience in convention activities, an experience from which the association has already had considerable benefit. Mr. Shugg was elected vice-president at the 1922 meeting after having served one full two-year term and two years of a three-year term as director. He has long been in the appliance field, having been connected with the General Electric Company at Schenectady, N. Y., for the past 22 years, during the first 14 years of which he was employed in the engineering and commercial departments of that company. During the last eight years, Mr. Shugg has been engaged actively as a specialist in the advertising department of the company on convention and exhibition matters. Indicative of his activities in this line of work are, among others, the positions of chairman of the exhibition committee of the American Electric Railway Association and director of exhibits of the National Electric Light Association. Mr. Shugg is a native of the middle west having been born at Highwood, Ill.

List of Exhibitors

The following is a list of the firms which are presenting exhibits, with the devices on display and the names of the representatives who are present at their booths.

Devices exhibited for the first time are shown in bold face type:

Adams & Westlake Company, The, Chicago.—Signal lamps; center core wicks; kerosene hand lanterns; switch locks; **highway crossing stop sign.** Represented by Alex. S. Anderson, Chas. B. Carson, C. F. Dick, Wm. J. Pierson, H. G. Turney and G. L. Walters. Spaces 87, 88, 106 and 107.

Adams Motor & Manufacturing Company, Chicago.—**Railway motor** cars, gasoline operated. Represented by W. E. **Adams**, R. S. Adams, G. F. Weinreich, W. A. Bailey and W. M. McClintock. Spaces 218 and 218½.

Air Reduction Sales Company, New York City.—Welding and cutting apparatus and supplies; automatic cutting machines. Represented by E. M. Sexton, B. N. Law and G. Van Alstyne. Spaces 167 and 168.

American Abrasive Metals Company, New York City.—Stair treads; car step treads; door saddles; elevator threshholds; drainage gratings; brake shoes. Represented by Charles A. Barker and R. P. Spooner. Space 153.

American Bolt Corporation, Boss Nut Division, Chicago.—Lock nuts; bolts; rivets. Represented by J. W. Fogg, C. Beaumont, E. T. McAuliffe, Geo. A. MacLean, J. A. MacLean, J. P. Crowley and A. F. McCoole. Spaces 1 and 2.

American Car & Foundry Company, Chicago.—Electric metal heaters; **bar heater.** Represented by Arthur G. Wood and Arthur F. Frost. Space 204.

American Chain Company, Inc., Bridgport, Conn.—Chain; **one-piece guard rail; cast steel guard rail clamp; steel valves.** Represented by G. C. Isbester, A. H. Weston, J. N. Lee, E. L. King, W. C. Wolfe, J. P. Ferguson and R. T. Hatch. Spaces 81, 82 and 83.

American Hoist & Derrick Company, St. Paul, Minn.—Railroad ditcher. Represented by W. L. Manson, Miss H. M. Hoeller, W. B. Maurer and J. L. Hickey. Space 88½.

American Kron Scale Company, Chicago.—Automatic dial scales. Represented by Carl F. Larson. Space 125.

American Malleable Castings Association, Cleveland, Ohio.—Malleable iron castings. Represented by Robt. E. Belt, Enrique Touceda and C. L. Eshleman. Spaces 181, 182 and 183.

American Radiator Company, Buffalo, N. Y.—Heating systems; **improved air valves; packless valves; quick vents.** Represented by Homer R. Linn, H. G. Krissel and B. D. Wellman. Space 187.

American Steel & Wire Company, Chicago.—Rail bonds and appliances; bonding tools; arc weld resistors; wires and cables; right of way fence; steel fence posts; stock yard fence. Represented by B. H. Ryder, Herman Bartells, C. S. Knight, C. F. Wiley, J. A. Alexander, L. P. Shanahan, J W. Collins, M. E. Evans, A. W. Froude, D. R. Waterman, H. H. Febrey, L. A. Dietrich and D. A. Merriman. Spaces 33 and 34.

American Valve & Meter Company, The, Cincinnati, Ohio.—Water columns; safety switch lock; interlocking switch stand; **improved water column and switch stand.** Represented by J. T. McGarry, D. J. Higgins, F. C. Anderson and J. DePinal. Spaces 130, 131 and 132.

Argyle Railway Supply Company, Chicago.—Rail clamps; rerailers; portable derail; steel fence posts; waterproofing compound. Represented by A. H. Green. Space 163.

Armco Culvert & Flume Manufacturers Association, Middletown, Ohio.—Culverts; flume sheets; alloy coated ingot iron; coupling band; highway signs; photographic exhibit; testing machine for measuring loads. Represented by D. M. Struckland and L. M. Sandstron. Spaces 99 and 100.

Baker R. & L. Company, The, Cleveland, Ohio.—Elevating trucks; tractor. Spaces 210 and 211.

Benjamin Electric Mfg. Company, Chicago.—Reflector units; heavy duty fittings. Represented by L. E. Snell, Wallace Goodrich, P. A. Powers and C. B. Harlow. Space 158.

Bethlehem Steel Company, Bethlehem, Pa.—Parallel throw switch stands; guard rails; gauge rods; tongue switches; girder rails. Represented by R. W. Gillispie, N. E. Salsich, G. S. Vickery, H. E. Stoll, F. A. Weymouth, H. Weymouth, M. Carroll, G. H. Riddle, J. V. Honeycutt, Richard Knibloe, J. S. Clark, E. E. Goodwillie, J. F. Hennessy, E. H. Gumbart, J. C. Chandler, J. S. Hegeman, E. S. Illig, E. B. C. Goyne, Wm. Chapman, H. M. Stark, R. Payson and J. T. Green. Spaces 200, 201, 214 and 215.

Blaw-Knox Company, Pittsburgh, Pa.—Clamshell buckets; **sectional steel buildings; proportioning plant for measuring concrete; truck turntable model.** Space 89.

Brach Manufacturing Company, L. S., Newark, N. J.—Lightning arresters. Represented by L. S. Brach, S. C. Bryant and G. Gort. Space 3.

Bronson & Company, E. B., Blue Island, Ill.—**Electric lanterns; dry battery container; rechargeable battery and cylinder lamp; prism lens.** Represented by F. T. Baird. Space 135.

Bryant Zinc Company, Chicago.—Highway crossing signals; signal supplies; **signal lamp light relay.** Represented by Sam'l Kris Kelly, Theo. Cole and John Hensel. Space 154 and 155.

Buda Company, The, Harvey, Ill.—Motor cars; power plants; bumping post; switch stands; track jacks; steel wheels; tool grinders; track and bonding drills; track guages and levels; electric locomotive headlight; **power plant**; pump. Represented by J. L. Artmaier, H. P. Bayley, H. C. Beebe, A. I. Bliss, C. H. Bull, Ed. Conant, F. T. Connor, R. B. Fisher, Sydney Francks, G. W. Hoover, H. L. Miller, J. E. Murray, M. A. Ross, F. E. Place, H. M. Sloan, L. M. Viles, W. S. Weston, C. W. Wood, Wm. P. Hunt, Jr., J B. Conant, Earle Conant, C. T. Miller, E. H. Walker and John R. Mayeskie. Spaces 61, 62, 63, 64 and 65.

Carbic Manufacturing Company, Duluth, Minn.—Portable acetylene lights; oxy acetylene equipment; cokes; **acetylene generator; welding torch; cutting torch.** Represented by D. C. Duncan, C. J. Nyquist, A. D. Guthrie and Gordon Paterson. Spaces 165, 166 and 166½.

Carnegie Steel Company, Pittsburgh, Pa.—Rail joints; sections of rails. Represented by N. M. Hench and R. L. Twitchell. Spaces 51½ and 52.

Carter Bloxonend Flooring Company, Kansas City, Mo.—Flooring; **flooring prepared for lateral nailing.** Represented by M. G. Truman, R. G. Stowell, F. L. Bronez, L. L. Buckley and R. L. Archibald. Space 219.

Central Electric Company, Chicago.—Electrical supplies. Represented by A. L. McNiel, R. N. Baker, J. M. Lorenz, L. R. Mann and E. H. McNiel. Space 17.

Challenge Company, Batavia, Ill.—Model of tank steel structure with pipe boxing and fixtures for delivering water to locomotive tank. Represented by Frank Snow, E. W. Johnson, John Carlson, W. J. Dickenson, H. E. Hansen and R. L. Lewis. Space 109.

Chicago Bridge & Iron Works, Chicago.—Conical and elliptical bottom elevated steel tanks for railroad water service; **self supporting dome roof for elevated tanks.** Represented by George T. Horton, Merle J. Trees, H. C. Brown, K. I. Small, H. B. Murphey, C. M. Ladd, Ralph Green, R. M. Campbell, F. L. Cook, Lewis McDonald, J. R. Donaldson, D. A. Leach, E. G. Ladd, E. E. Alt, W. D. Robinson, L. M. Powell, John Lucas, L. A. Elsener and Cedric B. Smith. Spaces 51 and 70.

Chicago Malleable Castings Company, Chicago.—Rail anchor tie plate; bumping posts. Represented by J. S. Llewellyn, W. M. Osborn and W. L. Beaudway. Space 142.

Chicago Pneumatic Tool Company, New York City.—Portable electric tools; electric track devices; pneumatic tools; portable compressor and accessories. Represented by A. E. Goodhue, H. G. Barbee, J. L. Rowe, J. D. Crowley, N. S. Thulin, E. K. Lynch, D. E. Cooke, A. C. Andresen, G. C. Vanden Boom and E. Aplin. Spaces 118, 119, 137 and 138.

Chipman Chemical Company, Inc., New York City.—Weed killer. Represented by R. N. Chipman, L. L. Edwards, B. G. Thompson and M. McComb. Space 45.

Clark Car Company, Pittsburgh, Pa.—Pictures and catalogs of side dump cars. Represented by H. E. Chilcoat, W. R. Kennedy and W. J. Fendner. Space 115.

Cleveland Frog & Crossing Company, Cleveland, Ohio.—Pictures and catalogues of frogs and crossings. Represented by G. C. Lucas, Geo. Stanton, L. G. Parker, G. A. Peabody and J. A. Donahey. Space 90½.

Cleveland Railway Supply Company, Cleveland, Ohio.—Metal foot guards; flangeway; switchstands; rail braces and tie plates; **cranes.**. Represented by W. H. Neeson and C. L. P. Russell. Space 133.

Conical Roller Cattle Guard Company, Nashville, Tenn.—Cattle guard. Represented by L. R. Campbell and F. M. Ewing. Space 136.

Creepcheck Company, The, Hoboken, N. J.—Rail anchors. Represented by P. E. Browne, T. D. Crowley, J. T. Reagen, Frank Reagen and Raymond Dinklage. Space 157½.

Crerar, Adams & Company, Chicago.—Track tools; drills; jacks. Represented by Russell Wallace, C. W. Gregory, J. A. Martin, G. D. Bassett, E. C. Poehler and R. M. Bullard. Space 28.

Detroit Graphite Company, Detroit, Mich.—Paints; varnishes; enamels. Represented by T. R. Wyles, P. L. Maury, W. D. Waugh, E. Booth, J. R. C. Hintz, L. D. Mitchell and A. B. Edge. Space 108½.

Diamond State Fibre Company, Bridgeport, Pa.—Insulation fibre. Represented by C. L. Simmons, J. B. Rittenhouse,

L. W. Shugg, Vice-President
G. C. Isbester, Honorary Director
C. W. Kelly, Secretary-Treasurer
E. A. Johnson, Director
T. W. Aishton, President
A. J. Filkins, Director
A. A. Taylor, Director
G. E. Geer, Director
W. J. Gillingham, Director
W. B. Murray, Director

George Brickley, J. H. Mueller, A. L. Sullivan and G. Swallow. Space 116.

Dickinson, Paul, Inc., Chicago.—Exhaust head; roof ventilators; engine house smoke jack; stove jacks. Represented by A. J. Filkins, E. B. Filkins, C. W. Hansen, H. T. Hutchinson and E. W. Rogers. Space 98.

Dilworth, Porter & Company, Inc., Pittsburgh, Pa.—Spikes and tie plates. Represented by Joseph Dilworth, W. F. Schleiter and A. Morrison. Space 27.

Direct Sales Company, The, Chicago.—Carbon brushes; graphite greases; graphite paints; dry graphite; dry batteries. Represented by Walter R. Pflasterer and Chas. Pflasterer. Space 152.

Doty Business Machines Company, Chicago.—Record calculating machines. Represented by Henry H. Doty. Space 163½.

Duff Manufacturing Company, Pittsburgh, Pa.—Lifting jacks. Represented by C. N. Thulin, C. A. Methfessel, E. A. Johnson, G. E. Anderson and W. G. Robb. Space 89½.

Edison, Thomas A., Inc., Bloomfield, N. J.—Batteries for signal service; switch lamp lighting by primary batteries. Represented by L. W. McChesney, R. E. Trout, F. S. Stallknecht, E. W. Brown, P. A. Garrity and E. W. Newcomb. Spaces 18, 19 and 20.

Electric Storage Battery Company, Philadelphia, Pa.—Batteries; **container for railway car lighting service; 3-cell unit for train control service.** Represented by H. B. Crantford, J. Lester Woodbridge, M. C. Pope, Jr., A. W. Pierce, W. H. Payne, W. H. Slocum, H. B. Hamilton, L. N. Crissman, E. H. Watkins, J. R. Folk, H. S. Mills, R. Whitehurst, W. R. Knappenberger, H. M. Beck and Wm. H. Palmer, Jr. Space 60.

Electric Tamper and Equipment Company, Chicago.—**Tie tampers; portable power plants.** Represented by C. Jackson, V. G. Cartier, Wayne Adams and Ray Cartier. Space 149.

Elwell-Parker Electric Company, New York City.—Crane truck; elevating platform truck. Represented by A. M. Brown, G. W. Brown and H. F. Ostrander. Spaces 229 and 230.

Engineering and Contracting, Chicago.—Magazines. Represented by L. S. Louer and R. W. Hume. Space 164½.

Eymon Crossing Company, Marion, Ohio.—Continuous-rail crossing. Represented by Byron E. Wilson and George H. Bryant. Space 169½.

Fairbanks-Morse & Company, Chicago.—Railway motor cars; water standpipe; electric motors; internal combustion oil engine; **oil standpipe; motor-generator set; battery charging outfit.** Represented by A. A. Taylor, F. M. Condit, E. E. Pendray, P. H. Gilleland, H. E. Vogel, E. J. Coverdale, B. S. Spaulding, J. L. Jones, E. W. Rowland, D. K. Lee, F. J. Lee, G. W. Lewis, E. C. Golladay, C. H. Wilson, C. B. O'Neil, H. L. Hilleary, F. P. Drinker, J. T. Frame, J. C. Flanagan, W. F. Anderson, L. R. Boyer, M. O. Southworth, C. G. Mahana, C. W. Pauk, F. V. Roy, R. F. Lane and H. M. Beebe. Spaces 73, 74, 75, 76, 92, 93, 94 and 95.

Fairmont Railway Motors, Inc., Fairmont, Minn.—Inspection car; section motor cars; handcar engines; **4 h. p. section motor car.** Represented by H. E. Wade, W. F. Kasper, J. P. Dunning, H. M. Starrett, W. D. Brooks, M. A. Evans, Carl W. Brhel and John McMahon. Spaces 41, 42 and 43.

Federal Electric Company, Chicago.—Electric lanterns; fuses; sirens. Represented by A. Z. Caron, H. W. Neal and O. S. Burke. Space 169.

Federal Signal Company, Chicago.—**Relays and light signals.** Spaces 47 and 48.

Frog, Switch & Manufacturing Company, The, Carlisle, Pa.—Steel frogs. Represented by L. E. Weidman and A. Gordon Jones. Spaces 30 and 31.

General Electric Company, Schenectady, N. Y.—Compensator; automatic starter; magnetic starter; pressure governor; pressure switch; portable arc welding equipment; lightning arresters and testing sets; automatic signal substation; headlight turbine; **battery charger; switch transformer; float switch.** Represented by J. G. Barry, H. M. Jacobs, John Roberts, C. C. Bailey, W. P. Madden, E. E. Kimball, L. W. Shugg, W. J. Hedley, W. H. Sigourney, F. P. Jones, H. C. King, E. B. Smith, R. L. Hughes, C. Dorticos, W. M. Brady, G. R. Anderson and R. T. Cheesman. Spaces 35, 36 and 37.

General Railway Signal Company, Rochester, N. Y.—Relays; controller; switch machines; signals; highway crossing lights; transformer; track reactor; unit lever; hand operated time release; electric lock; switch boxes; lamps; track resister; arrester. Represented by F. W. Moffett, F. L. Dodgson, W. K. Howe, W. S. Henry, M. Wuerpel, S. M. Day, C. S. Bushnell, J. E. Stephenson, E. C. Larry, W. J. Plogsted, S. N. Wight, P. E. Carter, R. C. Connell, W. D. Cloud, F. Benedict, L. Thomas, J. R. Wills, C. M. Deardorff, J. A. Geneser and H. W. Lucia. Spaces 49 and 50.

Gosso Bed Company, Chicago.—Beds. Represented by A. E. Gosso, A. R. Brunker and L. Jensen. Space 167½.

Graver Corporation, East Chicago, Indiana.—Water softening equipment; steel tanks; elevated water towers; **chemical apportioning device.** Represented by I. L. Birner, W. R. Toppan and J. J. Felsecker. Spaces 96 and 97.

Gurley, W. & L. E., Troy, N. Y.—Engineering and surveying instruments; scale inspectors' outfits; transits; rods; plane table outfits; compasses; tapes, current meters; hood gages; water level recorders. Represented by Clinton H. Smart, A. L. Baylis, H. M. Dilbert and L. C. Higbee. Space 69½.

Hall Switch & Signal Company, Garwood, N. J.—Automatic signals and signal appliances; **position color light signal; highway crossing flasher signal.** Represented by W. J. Gillingham, H. W. Wolff, O. S. Field, T. J. O'Meara, E. S. Berry, C. G. Harwig, D. R. Day. Spaces 85 and 86.

Hayes Track Appliance Company, Richmond, Indiana.—Derails. Represented by R. H. Gausepohl, S. B. Gehr, P. I. Harris, S. W. Hayes, L. S. Hillman, H. H. Jenkins, R. K. Johnston, Herbert J. Mayer and F. C. Stowell. Spaces 140 and 141.

Hazard Manufacturing Company, Wilkes-Barre, Pa.—Insulated wires and cables; armored signal cable; aerial cable; **locomotive wire.** Represented by W. S. Hart, H. B. Pflasterer, Geo. P. Cady and Geo. B. North. Spaces 21 and 22.

Headley Good Roads Company, Philadelphia, Pa.—Asphalt crossing. Represented by E. J. Hunt, W. T. Gilbert, T. B. Headley, J. P. Hennessey and F. X. Kern. Spaces 190 and 191.

Hobbs Storage Battery Corporation, Los Angeles, Calif.—**Two types of signal storage batteries.** Represented by J. C. Nevin, J. A. Greer and A. D. Hall. Space 9.

Hubbard & Company, Pittsburgh, Pa.—Shovels; tools. Represented by J. V. Smith, H. M. Pnarsich and Marshall Lasher. Space 143.

Idol Track Liner Company, Chicago.—Track liners. Represented by F. R. Sinning and T. D. Crowley. Space 225.

Illinois Steel Company, Chicago.—Tie plates, rail joints, steel wheels, track bolts, track spikes and screw spikes. Represented by P. W. O'Brien, D. T. Buffington, R. Korsan, C. B. Friday, O. H. Baker, L. G. Hagen, G. A. Price, F. Ohl, J. A. McCree, B. T. Wherry, R. G. Glass, C. R. Moffatt, J. G. Sullivan, Grant Monk and W. G. Hall. Spaces 70½, 71, 51½ and 52.

Illinois Zinc Company, Chicago.—Corrugated zinc sheets; zinc shingles. Represented by Leroy E. Nelson, W. A. Leahy and E. S. Gellatly. Space 7.

Ingersoll-Rand Company, New York City.—Tie tamping outfits; track tools; **rail drill.** Represented by Wm. H. Armstrong, Charles Dougherty, J. N. Thorp, Jr., J. P. Gillies and L. W. Schnitzer. Spaces 206 and 209.

Inland Steel Company, Chicago.—**Rails;** splice bars; track bolts and spikes; sheet steel. Represented by C. R. Robinson. Space 50½.

International Signal Company, New York City.—**Automatic train stop.** Represented by Jean F. Webb, Jr. Space 164.

Johns-Manville, Inc., New York City.—Insulations; roofings; floorings; smoke stacks. Represented by J. C. Younglove, G. A. Nicol, P. C. Jacobs, P. R. Austin, C. S. Clingman, E. E. Colburn, H. J. Crowe, H. Flannagan, R. A. Hamaker, F. J. Horne, J. D. Johnson, M. S. Kelly, W. H. Lawrence, H. G. Newman, A. H. Purdom, J. H. Trent and L. S. Wilbur. Spaces 174, 175, 176 and 177.

Jordan Company, O. F., East Chicago, Indiana.—Railroad ballast spreader; ditching attachments; **spreader-ditcher wings; ice cutting attachment.** Represented by A. L. Greenbaum. Spaces 56 and 57.

Kalamazoo Railway Supply Company, Kalamazoo, Mich.—Track drills; track gages; levels; wheels; trailers; cattle guards; **motor cars.** Represented by J. McKinnon, F. E. McAllister, D. A. Stewart, W. N. Sidman, H. R. Miller, L. W. Bates, R. E. Keller, L. W. Boswell, E. G. Powell, J. T. Kelly, D. P. Lamoreux, Stephen Smith and W. Singer. Spaces 8, 8½, 23, 24 and 25.

Kelly-Derby Company, Inc., Chicago.—Chemical toilets; **gasoline engine powered centrifugal pump.** Represented by Harry L. Bachman, Charles N. Leet, C. W. Kelly and Charles F. Smale. Space 189.

Kentucky Rock Asphalt Company, Louisville, Ky.—Natural rock asphalt. Represented by W. H. Tarven, W. A. Brownfield and W. F. Pollard. Space 157.

Kerite Insulated Wire & Cable Company, The, New York City.—Insulated wires and cables. Represented by B. L.

Winchell, Jr., P. W. Miller, J. W. Young, J. A. Renton, Azel Ames, W. H. Fenley, E. L. Adams, J. A. Hamilton and C. A. Reeb. Spaces 68 and 69.

Keystone Grinder & Manufacturing Company, Pittsburgh, Pa.—Tool grinders; **rail cutter redresser.** Represented by S. S. Newman, L. J. Cooney and H. C. Holloway. Space 193.

Koehring Company, Milwaukee, Wis.—**Concrete mixer.** Represented by K. H. Talbot, W. E. Hughes and G. E. Hillsman. Spaces 207 and 208.

L. & R. Culvert Company, Chicago.—Cast iron culvert. Represented by Wm. Robertson and R. F. Repasz. Space 184.

Lehon Company, The, Chicago.—Roofing; asphalt shingles; building paper, asphalt built-up roofs; waterproofing membranes. Represented by Tom Lehon, R. M. Chissom, John Eipper and Chas. Jung. Space 91.

Lorain Steel Company, The, Johnstown, Pa.—**Frogs; girder rails; switch stands; bolts and forgings.** Represented by C. Burton, P. M. Boyd, S. J. Cotsworth, E. B. Entwisle, E. M. Fry, H. L. Gleason, Wm. W. Kingston, A. S. Littlefield, H. H. McDonald, S. P. McGough, J. A. McHugh, Jno. A. Stacey and H. C. Stiff. Spaces 202, 203, 212 and 213.

Lufkin Rule Company, Saginaw, Mich.—Special tape and rules; surveyer's chains and pins; **machinist tools, including micrometers, calipers, combination sets, etc.** Represented by T. P. Young and P. M. Benjamin. Space 121.

Lundie Engineering Corporation, The, New York City.—Tie plates; rail anchors. Represented by John Lundie, Eugene Brandeis, L. B. Armstrong, W. S. Boyce and W. Brooke Moore. Space 90.

MacRae's Blue Book Company, Chicago.—MacRae's blue book. Represented by Albert MacRae, Thos. H. MacRae, Lloyd Simonson, L. R. Rollins, Clyde Hill, F. O. Rice, D. N. Peirce, R. S. Lundy, G. M. Hamilton, W. F. Miller, Jeff Corydon, R. S. Jaquith and Herbert Deeming. Space 9½.

Magnetic Signal Company, Los Angeles, Cal.—Highway crossing signals; relays. Represented by H. W. Renick, Sidney G. Johnson, Jay V. Wescott, Lawrence Boswell and W. D. Achuff. Space 165½.

Maintenance Equipment Company, Chicago.—Rail laying machine; power ballast cleaning machine; steel fence posts; derail; switchpoint straightener; shovels; tie spacer; friction carstop; tie puller. Represented by H. C. Holloway, J. A. Roche, Emmons Overmier and A. L. Arnold. Spaces 194 and 195.

Massey Concrete Products Corporation, Chicago.—Reinforced concrete pipe; concrete piling; bridge slabs; marker posts; battery wells; battery boxes; **reinforced concrete cribbing and cattle pass pipe.** Represented by E. C. Alexander, Charles Gilman, D. B. Hanna, E. M. Hatheway, J. A. Higgs, D. A. Hultgren, C. H. Hunsaker, Paul Kircher, P. E. Longstreet, W. L. McDaniel, G. H. Redding, W. H. Robertson and H. W. Wilder. Spaces 54 and 55.

McGraw-Hill Company, Inc., New York City.—McGraw-Hill publications. Represented by M. B. Knox, H. C. Anderson and Monroe Smith. Space 185½.

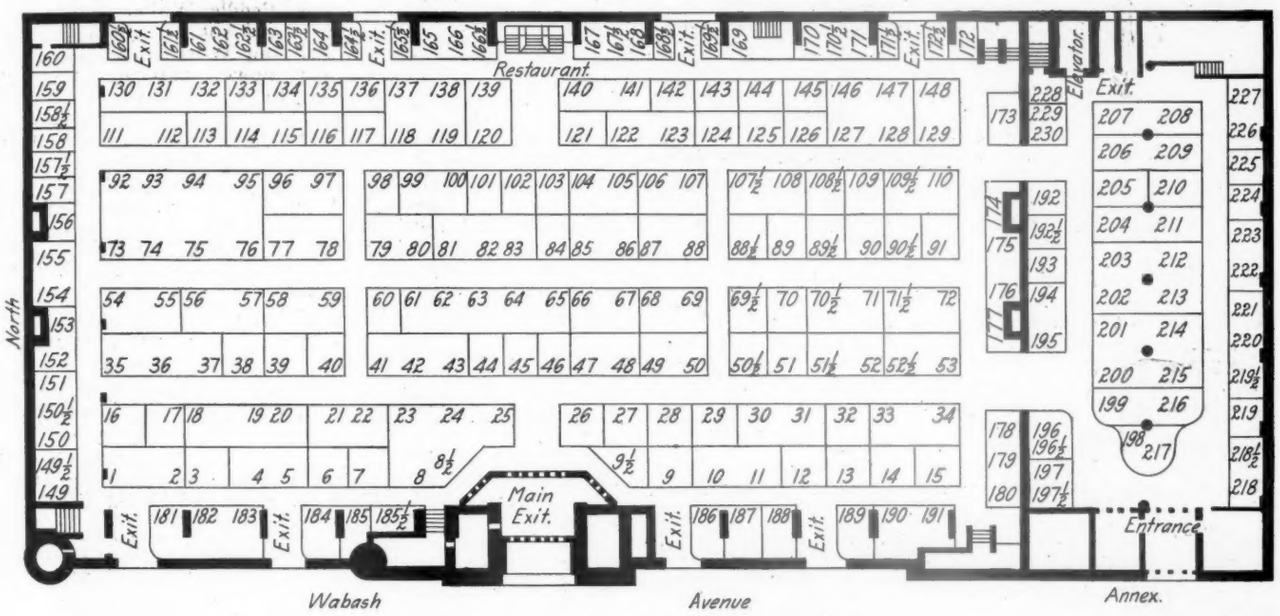
Mechanical Manufacturing Company, The, Chicago.—Bumping posts. Represented by H. E. Johnson. Spaces 219½, 220 and 221.

Mercury Manufacturing Company, Chicago.—Electric tractor; steel trailer; trailer equipment; motion pictures; **internal gear tractor; steel trailer.** Represented by John R. Bensley, L. R. Millar, Enis A. Bates, A. D. Shanks, Wm. I. Lott, L. F. Meissner and L. J. Kline. Spaces 226 and 227.

Metal & Thermit Corporation, New York City.—Samples of welds made in rail; materials and appliances. Represented by W. R. Hulbert, C. F. Lederer, H. S. Mann, C. D. Young, W. H. Moore and A. F. Beaulieu. Spaces 4 and 5.

Midvale Steel & Ordnance Company (Cambria Steel Company), Philadelphia, Pa.—Photographic exhibit. Represented by Ward A. Miller and Geo. A. Richardson. Space 71½ and 72.

Miller Train Control Corp., Danville, Ill.—Train control equipment. Represented by H. B. Miller, W. B. Murray, Eugene Murray, E. E. Murray and P. E. Herrin. Spaces 197 and 197½.



Floor Plan of the Coliseum and Annex

Morden Frog & Crossing Company, Chicago.—Steel frogs; guard rails; guard rail clamps; **tie plate and rail anchor; geared switch stand.** Represented by B. T. Gibbs, W. H. Hartz, Geo. F. Killmer, H. Macke, J. F. Karcher, Arthur C. Smith and W. J. Wilmot Gilbert. Spaces 199 and 216.

Mudge & Company, Chicago.—Railroad motor cars; push car and trailer; **motor car engine; section motor car.** Represented by Burton Mudge, Robert D. Sinclair, K. J. Eklund, A. C. Force, C. P. Benning, J. K. Vannatta, A. P. Grenier, J. M. Mulholand, V. Pagett and F. C. Whitehouse. Spaces 127, 128, 146 and 147.

Murdock Manufacturing and Supply Company, The, Cincinnati, Ohio.—Railway water service devices; hydrants; hose boxes; coach washers; **water service box; round house and ash pit box.** Represented by J. C. Endebrock. Space 134.

M. W. Supply Company, Philadelphia, Pa.—Rail benders; tie plate guard rail fasteners; switch heaters. Represented by Chas. Z. Vaughan. Space 101.

National Boiler Washing Company, Chicago.—Represented by F. W. Gale, T. G. Dalton and F. S. Wichman. Space 12.

National Carbon Company, Inc., Cleveland, Ohio.—Dry cells; flashlights; batteries; carbon products; storage cells; **storage cells for signal service.** Represented by A. E. Pratt, R. J. Cox, P. M. Etters, J. S. Gemmel, D. H. Green, M. D. Rees, L. M. Ritchie, W. A. Sisler, I. T. Kelly and P. G. Pendorf. Spaces 150, 150½ and 151.

National Lead Company, New York City.—Lead and lead products; paint materials. Represented by A. H. Sabin, F. M. Hartley, Jr., D. Louis Ireton, Chas. Haas and J. W. McArthur. Space 114.

National Lock Washer Company, The, Newark, N. J.—Nut locks. Represented by C. H. Loutrel, J. Howard Horn, F. B. Archibald, A. T. Thompson, R. L. Cairncross and R. B. Cardozo. Space 192.

National Malleable Castings Company, The, Cleveland, Ohio.—Malleable iron washers; tie plates; rail braces, rail anchors; wrecking hooks; couplers; friction draft gears; coiled spring journal boxes. Represented by T. W. Aishton, R. W. Chambers, G. A. Faitz, C. H. Krakau, G. R. Rasmussen and L. S. Wright. Space 102.

National Vulcanized Fibre Company, Wilmington, Del.—Insulation fibre. Represented by C. W. Sutton, C. C. Bell, H. C. Hackett, E. W. Patterson and John Barron. Space 126.

Nichols, Geo. P., & Bros., Chicago.—Electric turntable tractor; model of transfer table; **auxiliary turntable tractor.** Represented by Geo. P. Nichols, S. F. Nichols and N. Fries. Space 173.

North Western Motor Company, Eau Claire, Wis.—Railway motor cars and engines; **inspection car; engines.** Represented by F. W. Anderson, R. R. Rosholt and A. H. Nelson. Spaces 196 and 196½.

Ogle Construction Company, Chicago.—**Automatic reversing hoist;** model concrete coaling station. Represented by C. F. Bledsoe, M. W. Powell, J. G. Forester and L. S. Murphy. Space 29.

Okonite Company, The, Passaic, N. J.—Insulated wire and cables; portable cords; tapes; **fire detecting wire.** Represented by J. D. Underhill, F. C. Jones, W. R. Van Steenburgh, J. W. Hackett, C. Van Zandt and H. F. Tyberg. Space 16.

Otto Engine Works, The, Philadelphia, Pa.—Crude and fuel oil engine. Represented by J. R. Hughes. Space 185.

Oxweld Railroad Service Company, Chicago.—Equipment and samples of work done in welding battered rail joints, frogs, crossings, switch points. Represented by L. C. Ryan, W. H. Kofmehl, R. Rivett, H. W. Schulze, A. N. Lucas, W. A. Hogan and H. V. Gigandet. Spaces 10 and 11.

P. & M. Company, The, Chicago.—Rail anti-creepers; **bond wire protectors.** Represented by F. A. Poor, P. W. Moore, F. A. Preston, D. T. Hallberg, F. N. Baylies, S. M. Clancey, J. J. Gallagher, R. D. Hawley, G. E. Johnson, G. E. Olson, W. H. Reaves, P. V. Samuelson, L. S. Walker, M K. Ruppert and H. G. Warr. Spaces 122 and 123.

Page Steel and Wire Company, Bridgeport, Conn.—Galvanized bonds; welding wire; railway right of way fence; wire products. Represented by W. T. Kyle, C. A. McCune, E. J. Flood, S. J. Dewey and W. A. Berner. Space 84.

Patterson, W. W., Company, Pittsburgh, Pa.—Tackle blocks. Represented by W. W. Patterson, Jr. Space 145.

Pittsburgh-Des Moines Steel Company, Chicago.—Pictures of tanks. Represented by Max Whitacre. Space 40.

Pocket List of Railroad Officials, The, New York City.—Pocket list of railroad offiials. Represented by Chas. L. Dinsmore, Harold A. Brown and J. Alexander Brown. Space 26.

Portland Cement Association, Chicago.—Cement and concrete; **exhibit showing manufacture of cement.** Represented by D. A. Tomlinson and L. M. Arms. Space 117.

Positive Rail Anchor Company, Marion, Indiana.—Girder guard rail plates and braces; malleable iron tie plates; rail anchors. Represented by A. H. Told, L. C. Ferguson, J. Gelder and E. LeBeau. Spaces 178, 179 and 180.

Pyrene Manufacturing Company, Inc., Newark, N. J.—Pyrene; guardene and pump tank fire extinguishers; **foam type fire extinguisher.**. Represented by Chester A. Ragland, J. P. Maloney, H. S. Donnelly, H. M. McCullen and L. F. Meinel. Space 186.

Q. & C. Company, The, New York City.—Derails; step joints; re-railers; rail braces; target and switch stands; car replacer clamps; **electric snow melter; guard rail clamps.** Represented by C. F. Quincy, F. F. Kister, E. R. Packer, E. M. Smith, L. T. Burwell, R. J. McComb, J. L. Terry and Lewis Thomas. Spaces 120 and 139.

Rail Joint Company, New York City.—Rail joints; track liner. Represented by V. C. Armstrong, J. C. Barr, B. G. Braine, E. A. Condit, Jr., Alexander Chapman, C. A. Disbrow, J. A. Greer, C. B. Griffin, H. C. Hickey, Charles Jenkinson, G. H. Larson, Milton Markley, J. N. Meade, J. G. Miller, R. W. Payne, F. C. Runyon, Thomas Ryan, R. R. Seward, E. F. Schermerhorn, McLeod Thomson, W. Paton Thomson, F. C. Webb, G. T. Willard, Benj. Wolhaupter, D. P. Wolhaupter and Wm. A. Gadd. Spaces 79 and 80.

Railroad Accessories Corporation, New York City.—Signal blades; lightning rods; brackets; power rail drilling machines; channel pins; rail connections; pipe carrier bases; resistance units; hydrometers; keys and switches; **bonds; wire terminals; clip tags; crossing gate lamps.** Represented by F. C. Lavarack, E. M. Deems and H. Lavarack. Space 13.

Railroad Supply Company, The, Chicago.—Tie plates; derailers; signals; highway crossing bells; relays; meters; lightning arresters; **trickling charge rectifiers; light signal for highway crossing; lamp focusing device; channel pin.** Represented by E. H. Bell, H. M. Buck, Paul W. Kohmen, H. G. Van Nostrand, W. J. McDowell, A. H. Smith, Geo. W. Nibbe, T. W. Nicholson, F. M. Hill, R. D. Hawley, R. E. Bell, Geo. T. Cook, Geo. M. Kenyon and F. C. Webb. Spaces 104 and 105.

Railway Purchases and Stores, Chicago.—Magazines. Represented by Edward Wray and H. B. Kirkland. Space 159.

Railway Review, Chicago.—Railway publications. Represented by W. M. Camp, Clyde F. Burns, Harold A. Smith, A. E. Hooven, C. L. Bates and C. H. Gertner. Space 44.

Ramapo Ajax Corporation, Hillburn, N. Y.—Switch stands; guard rail; guard rail clamp; switch point; switch riser plate; rail braces. Represented by Thos. E. Akers, W. Bender, J. V. Cowling, R. J. Davidson, Jr., P. Hoffman, J. V. Houston, W. C. Kidd, W. A. Peddle, William Wait Snow and J. B. Strong. Spaces 109½ and 110.

Rawls Machine & Manufacturing Works, Chicago.—Railway trackmower and highway mower; **highway mower in motion pictures.** Represented by S. E. Rawls and H. S. Pettis. Spaces 161, 162 and 162½.

Raymond Concrete Pile Company, New York City.—Concrete piles. Represented by H. D. Raymond, E. D. Watt, A. C. Everham and A. E. Cummings. Space 188.

Reade Manufacturing Company, Jersey City, N. J.—Weed exterminator. Represented by Charles H. Reade, R. H. Bogle and R. W. Pritchard. Space 228.

Regan Safety Devices Company, Inc., New York City.—Locmotive train control equipment. Represented by J. Beaumont and Frank Lepreau. Space 144.

Reliance Manufacturing Company, Massillon, Ohio.—Nut locks. Represented by H. J. McGuire, A. C. Rule and D. L. Robertson. Space 224.

Richards-Wilcox Mfg. Company, Aurora, Ill.—Sliding doors for railroad buildings. Represented by A. J. Eggleston, J. H. Wise, A. H. Tax and Ellis Phillips. Spaces 170, 170½ and 171.

Roberts and Schaefer Company, Chicago.—**Mechanical cinder conveyor; drag scarper storage and reclaiming facilities.** Represented by Clyde P. Ross and David E. White. Space 14.

Roberts Company, The Geo. J., Dayton, Ohio.—Miniature water treating plant. Represented by John C. Jamieson. Space 160½.

Sellers Manufacturing Company, Chicago.—Wrought iron tie plates. Represented by J. M. Sellers, R. A. Van Houten, G. M. Hogan and R. J. Platt. Space 124.

Sherwin-Williams Company, The, Cleveland, Ohio.—Represented by Arthur Larkins, R. V. Goodremont, George A. Dorwart and W. F. Gallinger. Space 15.

Signal Accessories Corporation, Utica, N. Y.—Signal appliances; **latch lever lock for mechanical interlocking machines.** Represented by W. F. Bossert, J. C. Edwards, S. G. Johnson and O. S. Flath. Space 113.

Simmons-Boardman Publishing Company, New York City.—Railway publications; Railway Age; Railway Engineering and Maintenance; Railway Signal Engineer; Railway Mechanical Engineer; Railway Electrical Engineer; Maintenance of Way Cyclopedia; Boiler Maker; Marine Engineering; Books. Represented by L. B. Sherman, Samuel O. Dunn, Henry Lee, C. R. Mills, E. T. Howson, F. C. Koch, R. F. Duysters, J. M. Rutherford, B. J. Wilson, E. A. Lundy, W. S. Lacher, K. E. Kellenberger, Milburn Moore, D. A. Steel, J. H. Dunn, C. B. Peck, J. C. Emery, Homer Beach, J. P. O'Hern, W. F. Rench and George Slate. Space 46.

Snow Construction Company, T. W., Chicago.—Oil cranes; **sand drier; water valve.** Represented by T. W. Snow, S. C. Crawford, B. S. Snow and V. L. Walker. Spaces 107½ and 108.

Southern Signal Company, Louisville, Ky.—**Track instruments; signal number plates; trunking saddle.** Represented by J. E. Clough and L. R. Zhender. Space 6.

Templeton, Kenly & Company, Ltd., Chicago.—Track and bridge jacks. Represented by C. H. Canning, M. J. Evans, A. C. Mills, J. L. Crowley, A. C. Lewis, Wm. Simpson, Jos. Dolar, G. L. Mayer and W. B. Templeton. Space 32.

Thompson Bros. Company, Chicago.—Reflecting warning signals. Represented by R. A. Thompson. Space 172.

Torchweld Equipment Company, Chicago.—Oxy-acetylene welding; cutting and lead welding equipments; **gas pressure regulators; machine welding and cutting torches.** Represented by W. A. Slack, C. F. Egbert, C. F. Hill, T. P. Birch, J. L. Jenson and R. M. Smith. Space 156.

Track Specialties Company, Inc., New York City.—Guard rail clamp; step joint; guard rail brace; spike; armored insulated track bolt; rail benders; derailers; rail joint; anchor plate; rail brace; track shim; **tie dating nails; tie markers.** Represented by W. B. Lee and J. A. Bodkin. Space 39.

Train Control Appliance Company, El Paso, Tex.—Automatic train stop. Represented by M. B. Bulla and J. P. Nash. Space 161½.

Union Switch & Signal Company, Swissvale, Pa.—Relays; circuit controller; facing point lock; switch circuit controller; clockwork time release; highway crossing signal; automatic flagman; position light signal; color light signal; switch and lock movement for outlying switch and circuit controller; signal mechanism. Represented by W. P. Allen, C. R. Beall, G. A. Blackmore, W. H. Cadwallader, Roy Clayburn, J. P. Coleman, J. J. Cozzens, Aaron Dean, M. L. Gray, R. M. Gilson, H. W. Griffin, J. S. Hobson, L. F. Howard, L. V. Lewis, J. L. Loucks, George Marloff, W. P. Neubert, H. McCready, J. E. Saunders, H. R. Sheene, W. W. Talbert and J. F. Talbert. Spaces 66 and 67.

U. S. Wind Engine & Pump Company, Batavia, Ill.—Model water tanks and towers; water columns; pumps; switch stands; semaphores; float valves; tank valves; windmills. Represented by L. E. Wolcott, C. E. Ward, J. P. Prindle and T. S. Daniels. Spaces 111 and 112.

Verona Tool Works, Pittsburgh, Pa.—Track and maintenance of way tools; track jacks; rail anchors; nut locks; rail joint springs; track gages, track levels. Represented by E. Woodings, J. S. Wincrantz, Porter L. Laughlin, W. W. Glosser and Wm. F. Hart. Spaces 129 and 148.

Volkhardt Company, Inc., Stapleton, S. I., N. Y. C.—Railroad water hydrants. Represented by Wm. Volkhardt. Space 160.

Wailes-Dove-Hermiston Corporation, Cleveland, Ohio.—Protective paints and coatings. Represented by Irving Noonan, J. A. Graves and Wm. P. Tobin. Space 149½.

Warren Tool & Forge Company, Warren, Ohio.—Railroad track tools. Represented by J. D. Robertson, M. J. Konold, Geo. F. Konold, Sr., and H. C. Mull. Spaces 222 and 223.

Waterbury Battery Company, The, New York City.—Cylinder cells and renewals. Represented by M. L. Martus, G. A. Nelson, G. S. Gaunt, S. J. Hough and O. B. Frink. Space 38.

West Disinfecting Company, New York City.—Insector machines; insecticides; disinfectants. Represented by H. E. Daniels, W. L. Larry and E. C. Daniels. Space 171½.

Western Electric Company, Inc., Chicago.—Signal tape; lighting units; wire and cable; wiring devices; spark plugs; expanded steel poles; portable cord and cable. Represented by G. H. Porter, Otis B. Duncan and Harry C. Gump. Spaces 58 and 59.

Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa.—**Motor with automatic starter;** motor with automatic control and starting panel; crane motor; muffler furnace; sample welding board; headlight outfit. Represented by G. P. Keech, L. A. Spangler, W. R. Jacobs, Fred Hansen and C. D. Pence. Spaces 77 and 78.

Wharton, William Jr., & Co., Inc., Easton, Pa.—Part of movable point of double slip crossing; knuckle rails; switch end of double slip. Represented by H. F. McDermott. Spaces 52½ and 53.

Wood Shovel & Tool Company, The, Piqua, Ohio.—Shovels; scoops; spades; track shovel with step on blade. Represented by C. L. Butts and W. W. Wood, 3d. Space 185½.

Woolery Machine Company, Minneapolis, Minn.—**Railway section motor car; weed plow; combination belt and roller chain transmission; railway motor car engines.** Represented by H. E. Woolery, D. A. Woolery, P. J. Rembold and D. D. McGinn. Space 205.

Wright Manufacturing Company, Lisbon, Ohio.—Chain hoists; trolleys; **high speed hoist.** Represented by W. F. Wright, R. C. Blair, E. B. Low, R. F. Straw, H. D. Albee and S. J. Woodworth. Space 192½.

Wyoming Shovel Works, The, Wyoming, Pa.—Track shovels; **track shovel testing machine.** Represented by H. T. Potter, G. E. Geer, H. C. Emery and Stanley H. Smith. Space 103.

National Train Control

THE NATIONAL SAFETY APPLIANCE COMPANY, San Francisco, Cal., has recently made several important developments in the track magnet and duplex control valve unit used in its train track control system. This system is of the intermittent induction type employing magnets on both the track and the locomotive units.

Actuation from the track to the train is by means of magnetic induction. The track apparatus lies wholly

Fig. 1—New Track Magnet with Cover Removed

below the upper surface of the track rails. Clearance between track apparatus and that on the train is from five to six inches and there is no mechanical contact. The magnetic control valve unit, the pneumatic stop valve, and the release and double-heading cock, are located on the engine; a permanent magnet, controlled electrically, is placed between the rails at each indication point.

The new type track magnet, shown in Fig. 1, is 60 in.

Fig. 2—New Magnetic Valve Mounted Under Tender

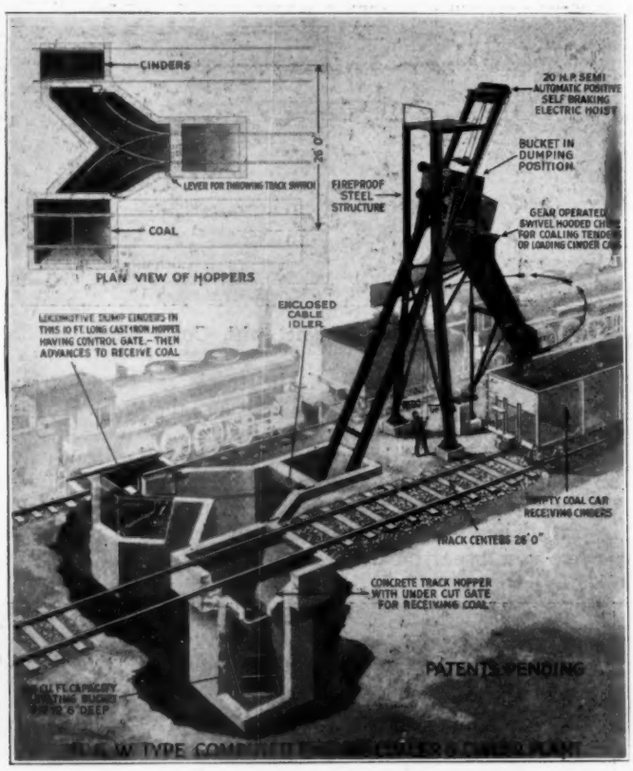
long, 30½ in. wide and 5½ in. high, its sides being 13 in. from the gage line of the rails. It consists of four groups of permanent magnet bars and three electro-magnet coils for controlling the field of the permanent magnets. It is designed to afford a uniform magnetic field of ample length which is controlled through the agency of the electro-magnets at a minimum current.

The principal improvements in the duplex control valve unit are the isolation of the magnetic circuit of one valve from that of the other; the use of laminated steel in the inductor planes which conduct this circuit; and the im-

proved form of protection against broken inductor planes. The use of laminations in the inductor planes and the isolation of one valve from the other provides an improved magnetic circuit and prevents one valve from having any influence on the other. The tell-tale air circuit on the upper surface of the inductor planes is positive in its action in case of any damage to the valve unit.

One Man Coal and Cinder Plant

THE PENNSYLVANIA is now constructing at Millville, N. J., a combined engine coaling and cinder plant operated by one man and requiring his attention only while a locomotive is being served. This plant consists essentially of two parallel tracks on 26 ft. centers, below each of which is located a concrete pit, one for



The Type of Coal and Cinder Plant Being Built at Millville, N. J.

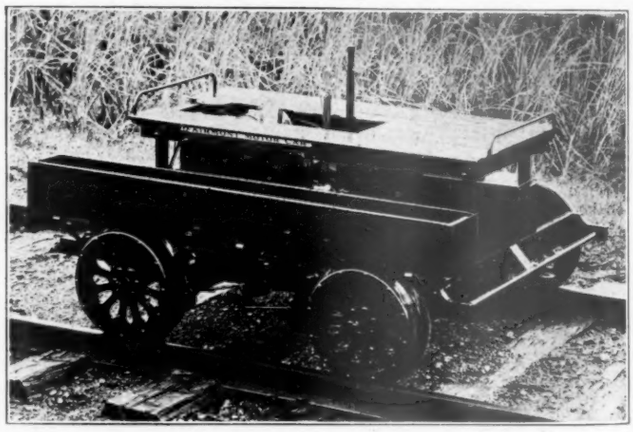
cinders and one for coal, from which the material is carried in a car up an incline to the receiving end of a chute which discharges into the locomotive tender or cinder car, as the case may be. Under this arrangement, the locomotive is first spotted over the cinder pit and, after cleaning fires, is moved forward to the coaling point. The cinders are dumped into a cast iron hopper 10 ft. long, where they are wet down and held by means of a hopper gate until disposal. Opening this gate by means of a lever at the side of the track empties the cinders directly into the car, which has a capacity sufficient for all cinders deposited at one dumping. This car is then hoisted to the chute by pressing an electric button which sets in motion a 20 hp. open-spur, gear-type, direct-connected electric hoist located on the overhead structure.

The coal receiving pit, in turn, is provided with a 12-ft. hopper from which the coal is emptied into the tram car by means of a 24-in. by 36-in. clam shell gate, which is designed for mine run coal and is operated by an 18-in. hand wheel situated on the ground level at a point where the operator can see the filling of the tram car. For coaling purposes, the plan contemplates the spotting and leaving of a coal car over the coal receiving hopper until emptied, when it is then spotted in a position below the chute for loading cinders, the track being built on a two per cent grade to facilitate shifting the car to the new position. The superstructure of the plant is of structural steel, all located between the tracks and equipped with an automatic brake to prevent overwinding of the tram car when hoisted and so designed that the loading chute can be swung from the normal position parallel to the track to a position over either the cinder car or the locomotive tender. This operation, as well as that of operating the hoist, is conducted from a convenient point on the ground.

The plant has been developed with a view to its use at points where conditions do not warrant a more expensive installation or where it is desired to provide a facility which may later be dismantled at small cost and used elsewhere. As constructed, it is estimated that coal may be handled at the rate of 40 to 50 tons per hour and locomotives served at the rate of 50 per day. The plant is a product of the Roberts & Schaefer Company, Chicago, and is an adaptation of its N & W type cinder plant for the combined purpose of handling coal and cinders.

New Fairmont Motor Car

THE FAIRMONT RAILWAY MOTORS, INC., Fairmont, Minn., formerly the Fairmont Gas Engine & Railway Motor Car Company, has built a new motor car which has been designed to meet the need of branch line service where the gang is small and where it is usual for it to be reduced to as few as two men during the winter and where occasionally the work is left to the foreman alone. This car weighs 635 lb. and is propelled by a 4-hp. Fairmont ball-bearing motor.. One of its distinctive



The New Fairmont Car for Branch Line Use

features is a removable tool box carried on one side of the car above the wheels and extending the full length of the car. Another feature of the car is the provision made for overcoming side thrust while the car is in operation, this thrust being taken up by adjustable collars and the axle box casings in such a way that no thrust comes on the wheel hubs to cause their rapid wear and frequent renewal.

A lifting pipe rail extends the full width of the car at each end and provides a convenient and practical means of handling the car. One end of the housing seat forms a capacious locker for miscellaneous material and small tools. This car is the No. M-14. Several cars have already been furnished the Bangor & Aroostook.